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BETCK205J/ BETCKJ205

Second Semester B.E./B.Tech. Degree Supplementary Examination, June/July 2024

Introduction to Embedded Systems

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

3. Draw neat block diagram/ flow diagram/ wherever necessary.

Module – 1				M	L	C
Q.1	a.	What is an embedded system? Explain the different applications of embedded systems.		7	L2	CO1
	b.	Differentiate between RISC and CISC processors.		6	L2	CO1
	c.	Explain the sequence of operation for communicating with an I2C slave device.		7	L2	CO1
OR						
Q.2	a.	Differentiate between general purpose systems and embedded systems.		6	L2	CO1
	b.	What are sensors and actuators? Explain the operation of matrix key board.		7	L2	CO1
	c.	Explain the various purposes of embedded systems in detail with illustrative examples.		7	L2	CO1
Module – 2						
Q.3	a.	What is operational quality attribute? Explain the important operational quality attributes to be considered in any embedded system design.		8	L2	CO2
	b.	Explain washing machine as application specific embedded system.		7	L2	CO2
	c.	The availability of an embedded product is 90%. The Mean Time Between Failure (MTBF) of the product is 30 days. What is the Mean Time To Repair (MTTR) in days/hours for the product?		5	L3	CO2
OR						
Q.4	a.	What is non-operational quality attribute? Explain the important non-operational quality attributes to be considered in any embedded system design.		8	L2	CO2
	b.	Explain different Electronic Control Unit (ECU) and communication buses used in automotive applications.		7	L2	CO2
	c.	In brief explain characteristics of an embedded system.		5	L2	CO2
Module – 3						
Q.5	a.	What is hardware software co-design? Explain the fundamental issues in hardware – software co-design.		7	L2	CO3

	b.	Explain the different computational models in embedded system design.	8	L2	CO3
	c.	What is Electronic Design Automation (EDA) tool? Explain the role of EDA tools in embedded system design.	5	L2	CO3
OR					
Q.6	a.	What are combinational circuits and sequential circuits? Explain each with example.	7	L2	CO3
	b.	With a neat flow diagram, explain the various steps involved in VHDL based VLSI IC design process.	8	L3	CO3
	c.	Explain the different types of IC design. Give an example for each.	5	L2	CO3
Module – 4					
Q.7	a.	Explain 'super loop' based and 'OS' based embedded firmware design approaches.	7	L2	CO4
	b.	With neat block diagram, explain the process of conversion from assembly language to machine language.	8	L2	CO4
	c.	What is the difference between compiler and cross compiler?	5	L3	CO4
OR					
Q.8	a.	With neat block diagram, explain the process of conversion from high level language to machine language.	8	L2	CO4
	b.	In brief explain the different files generated during the cross – compilation of an on embedded 'C' file?	7	L2	CO4
	c.	Define the following : i) Disassembler ii) Decompiler iii) Simulator.	5	L1	CO4
Module – 5					
Q.9	a.	Explain the operating system architecture with neat diagram.	7	L2	CO5
	b.	Explain the basic functions of a real time kernel.	7	L2	CO5
	c.	Discuss the following terms with respect to operating system i) Task ii) Process iii) Thread.	6	L2	CO5
OR					
Q.10	a.	Explain the structure of a process with memory organization diagram.	10	L2	CO5
	b.	Explain context switching, context saving and context retrieval.	10	L2	CO5
